REMARKS

Reconsideration and allowance in view of the foregoing amendments and the following remarks is respectfully requested.

Claim amendments/Status

Claims 13-24 remain pending in the application.

Claims 13-24 have been indicated as being allowable if rewritten or amended to overcome the rejection(s) under 35 USC § 101, set forth in this Office Action.

In this response, claim 13 is amended in a manner which clarifies the subject matter for which patent protection is sought and which obviates the rejections under 35 USC § 101 by calling for a physical transformation in the form of a development of a two-dimensional map. Support for the clarifying amendment is found in at least claim 23.

Further, even without this physical transformation, in accordance with the *Bilski* decision, the central question is "whether Applicants' claim recites a fundamental principle and, if so, whether it would pre-empt substantially all uses of that fundamental principle if allowed." *Bilski* at 954. In other words, it is necessary to distinguish between "claims that 'seek to pre-empt the use of' a fundamental principle, on the one hand, and claims that seek only to foreclose others from using a particular 'application' of that fundamental principle, on the other. *Id.* at 953 (quoting *Diehr*, 450 U.S. at 187). In this case the claims are limited to the latter.

The claimed invention relates to a method for determining optimal chamfer mask coefficients for distance transform which provides a useful, concrete and tangible result.

To facilitate the navigation of a vehicle, for example an aircraft, it is useful to estimate, using a navigation computer, its position on a map of a portion of the terrestrial globe and its Euclidian distances relatively to some points of the terrestrial globe for example relatively its destination point or relatively to any dangerous obstacles, etc.

A map of a portion of the terrestrial globe is built from the points of a terrain elevation database made from a regular latitude and longitudinal meshing and can be considered as an image whose pixels are the points of the terrain elevation data base. There are numerous methods to estimate Euclidian distances on a map, among these, those using chamfer distance transforms.

Chamfer distance transforms have various benefits of which the main ones are a reduction in the complexity of the calculations by virtue of exclusive use of integers. This reduction in the complexity of calculation is very useful in reducing the calculation and activity load on a navigation computer but is made at the price of approximations in the Euclidian distance estimations due to the integer values of the coefficients of the chamfer mask which approximates the various neighborhood distances to within a multiplicative scale factor.

With a given multiplicative scale factor, two integer values are available for each coefficient of the chamfer mask: the closest integer under-value and closest integer over-value of the product of the multiplicative scale factor by the Euclidian proximity distance represented by the coefficient considered. The choice of one or the other integer value for each coefficient has an influence on the error rate in the Euclidian distance estimations (see the specification page 17) and the possibilities of choice (2 to the power of coefficient number) are numerous because of the number of coefficients which are associated with a chamfer mask.

The approximations in the various neighborhood distances resumed in the coefficients of a chamfer mask can always be reduce by increasing the multiplicative scale factor adopted for the choice of the integer values of the coefficient of the chamfer mask. However, increasing the multiplicative scale factor increases the complexity of calculation required to estimate an Euclidian distance and implies to increase the power of calculation of the navigation computer.

The optimal choice for the coefficients of the chamfer mask with a given multiplicative scale factor in order to obtain a desired precision in the estimations of Euclidian distance at price of a minimum of calculations is even more important when the image constituting the map has a defect of anisotropy provoked by a terrain elevation database made from a regular latitude and longitudinal meshing.

In a nutshell, a method for determining optimal chamfer mask coefficients for distance transform with a given multiplicative scale factor is very useful in order to obtain the desired precision in the estimations of Euclidian distance with a minimum of calculations and to reduce the calculation load on a navigation computer.

The method defined in claim 1 comprises two successive sorts. The first sort is made on an entirely defined population of candidate integers, each chamfer mask coefficient having two candidate integers: an under-value and an over-value and with a concrete criteria: a maximum distance estimation error rate in the estimations of distances of the image pixels aligned on an axis of displacement of the image corresponding to the direction going from an origin source pixel for the distance measurements that is subjected to the analysis of the chamfer mask to the pixel of the mask associated with the coefficient considered.

The second sort is made on the candidate integers having passed the first sort and with a concrete criteria: a maximum distance estimation error rate in the distance estimations of the image pixels contained in an angular sector of the image, delimited by two axes of displacement of the image corresponding to the directions going from the source pixel subjected to the analysis of the chamfer mask to the two pixels of the mask that are associated with the coefficients.

After these two sorts, an arbitrary selection is made or not, whenever there is at least one integer candidate value issued from the first and second sorts for each coefficient. The coefficients are used in connection with the development of a two dimensional map.

Conclusion

All objections and rejections having been addressed, it is respectfully submitted that the present application should be in condition for allowance and a Notice to that effect is earnestly solicited.

Early issuance of a Notice of Allowance is courteously solicited.

The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

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To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,
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